

"blind-cord" action could be set up enough to be a primary agent in the transportation of sediment.

Quitting this very debatable question, we heartily congratulate Mr. Jukes-Browne and the Survey on this instalment of a complete memoir on the Cretaceous rocks of England. The possession of a synoptic view of any one formation is a great boon to geologists, as it saves them from the labour of hunting through a number of separate Survey memoirs. In future it might perhaps be well to shorten those explanatory of the maps by reserving all broader question for volumes like the present one. In this we note with especial pleasure the inclusion of chapters written by a geologist without any official position as an indication that the Survey now welcomes external help. The "get-up" of the volume shows improvement, but there is room for more. The illustrations, for instance, suffer from the thinness of the paper, through which the type can be seen. This defect spoils an excellent outline sketch on p. 152. A few plates, however, are printed on separate paper, and yet the book is issued at a moderate price. Difficult as it notoriously is to overcome the love of saving a ha'porth of tar so characteristic of Treasury officials, we wish the Director-General still greater success in persuading them to come nearer to the level of the volumes issued by the Geological Survey of the United States.

T. G. BONNEY.

THE PRINCIPLES OF PATENT LAW.

The Law and Practice relating to Letters Patent for Inventions. By R. W. Wallace and J. B. Williamson. Pp. lxxv + 922. (London: W. Clowes and Sons, Ltd., 1900.)

THE subject of inventions is always an interesting one whether to the manufacturer or to the man of science, nearly all new improvements in commercial chemistry or mechanics being, in these days of vigorous competition, sought to be protected by Letters Patent. Whether the English system of patent law is entirely satisfactory in all its details is a matter on which there are many opinions, and the Committee now inquiring into this may possibly suggest some alterations being made.

As a guide to the existing state of the law up to the most recent decisions in the Courts, Messrs. Wallace and Williamson have issued this volume, which may be called a treatise rather than a text-book. The arrangement and division of the subject is clear; starting from the granting of the Letters Patent, the reader is carried on to what is required of an inventor to render the grant valid and up to the petition for extension. Very little attention is given to the past history of the law, only a few pages being devoted to the well-known cases of the early part of the seventeenth century and a few remarks made on the history of claims. On the difficult subject, in which every discoverer of some new process must be interested, of what is necessary to constitute a patentable invention, the authors have not attempted to lay down any definition of their own, but have devoted two chapters to a careful collection of the important decisions on the point. In fact, throughout the book

there is given the material for forming an opinion rather than definitions.

For those who have not a well-stocked library of law-books there is the very great advantage that this volume gives verbatim extracts of nearly every important case, and even for those who have the books at command it will often save them the trouble of hunting up the passages they most often need. For those professionally interested in the subject there is a full and accurate account of the various steps in an action for infringement, which is very clearly set out; and after 600 pages of text there are some 250 of appendices containing the various statutes, together with forms and precedents for almost every conceivable case.

The principles upon which the specifications and claims should be drafted are adequately dealt with, and the question of amendment is gone into. There is a short chapter on the procedure on petitions for compulsory licenses, which procedure, curiously enough, does not appear to have attracted the attention of those who would be likely to benefit by it until within the last two or three years.

The printing of the work has been well done in large type and on good paper, the headings to the various paragraphs being sufficiently clear. A conspicuous feature of the work is the full index and the table of cases, which gives with each case the date of the decision and the subject-matter of the patent decided on. The book may confidently be recommended to any one desiring a complete account of the principles upon which our system of patent law is founded, as well as to those who constantly require a trustworthy book of reference.

HISTORICAL CHEMISTRY.

Lectures on the History of the Development of Chemistry since the Time of Lavoisier. By Dr. A. Ladenburg. Translated from the second German edition by Leonard Dobbin, Ph.D., with additions and corrections by the author. Pp. xvi + 373. (Edinburgh: Published for the Alembic Club by W. F. Clay. London: Simpkin, Marshall, Hamilton, Kent and Co., Ltd., 1900.)

THE small knot of chemists in Edinburgh who constitute the Alembic Club have already earned the thanks of chemists by placing at the disposal of English readers their valuable reprints of important chemical memoirs, a series which it is hoped may run on long and, if possible, at an increasing rate. The present volume is a more ambitious undertaking, being the translation of a substantial work which has long enjoyed much favour in Germany as a lucid and not too bulky account of the development of modern chemistry.

English chemical literature is not rich in original historical writing, though there are at least one or two British chemists who may be looked to with confidence for the occasional production of a scholarly and readable contribution. Going back a long way, it may be said that Thomas Thomson's "History" is inferior to no book of the kind published since—in respect to literary style and readableness. But in those days the science was narrower, and it was well within the ability of one man to do justice to the whole subject. The exhaustive historical

writings of Hermann Kopp, and the more recent contributions of Berthelot, leave little to be desired in completeness, and provide a repository of information invaluable for purpose of reference. This, however, is literature for the fully fledged chemist or chemical author.

The chemical student requires something different. The importance to him of attending to the historical aspect of chemistry is recognised by most teachers. It is indeed maintained by some that there is no other satisfactory way of approaching even the elements of chemistry, than by performing experiments in historical order. A Board School might be cited where the older boys are given the Alembic Club reprints, and asked to do the experiments as there described. Whatever may be thought of this, it cannot be denied that a study of chemical history is most important, not only for a clear grasp of the origin and growth of our present theories, but because of that more subtle influence on the mind and imagination which perhaps may be included in the much-abused word culture.

The full advantage of historical study is not to be obtained by the reading of such a work as the one under notice, but rather by the careful study of those original memoirs or books which will ever remain landmarks in the track of scientific progress. At the same time, a connected history is a useful and perhaps a necessary adjunct to these partial studies, and this want is met extremely well by the book under notice.

Prof. Ladenburg has cast his story in the form of lectures, and for the purpose in view this is a satisfactory arrangement. In tracing the history of chemistry from the time of Lavoisier to the present day a vast amount of material has, of course, to be dealt with; and of the prodigious amount of reading and critical examination entailed upon the author there is abundant evidence both in the text and in the numerous references which are appended. As to the general balance of the book it may be said that the earlier part is fuller and more explanatory than the later. The account, for example, of the controversy between Berthollet and Proust is very clear and interesting, whilst the accounts of the controversies that raged later in the century in regard to fundamental questions of organic chemistry are much more compressed and difficult to follow. The last chapter of the book is little more than an enumeration of the chief chemical topics that have engaged attention during the past fifteen years.

However, looking at the book as a whole, it must be said that Prof. Ladenburg has produced a most useful history, extremely readable considering the inevitable compression, remarkably free from the bias of personal opinions, and giving a connected view of the progress of chemical science which will be of great benefit to students.

Dr. Dobbin has succeeded admirably in the arduous work of translating narrative German into narrative English. Here and there sentences are to be found which declare their origin; but on the whole the English (or should one say British?) flows smoothly, and there is a remarkable absence of typographical errors or mistakes of a more serious kind. Dr. Dobbin and the Alembic Club may certainly be congratulated on their latest contribution to chemical literature.

A. S.

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OUR BOOK SHELF.

Untersuchungen über Mikrostrukturen des erstarrten Schwefels nebst Bemerkungen über Sublimation, Überschmelzung und Übersättigung des Schwefels und einiger anderer Körper. By O. Bütschli. Pp. iv + 96; 4 plates. (Leipzig: W. Engelmann, 1900.)

Untersuchungen über die Mikrostruktur künstlicher und natürlicher Kieselsäuregallen (Tabaschir, Hydrophan, Opal). By O. Bütschli. Pp. 287-348; 3 plates. (Reprinted from *Verhandl. d. Naturhist.-Med. Vereins zu Heidelberg*, N.F. Band vi. 1900.)

A PREVIOUS work by the professor of zoology at Heidelberg ("Untersuchungen über Strukturen," 1898), reviewed in NATURE (vol. lx. p. 124), dealt more especially with the microstructure of organic substances, comparing them with the supposed alveolar structure of protoplasm. In the first of the present pamphlets the author describes in minute detail his observations in the same direction made on inorganic substances, more particularly sulphur. Amongst the various globular and crystalline forms produced by the sublimation and subsequent transformations of sulphur, he describes some which have a radial or concentric arrangement of vacuities or air-spaces suggesting an alveolar structure. The subject is, however, treated throughout from a crystallographic rather than from a biological point of view, and much the same ground has been covered in a more concise and earlier paper by Dr. R. Brauns, the professor of mineralogy at Giessen ("Beobachtungen über die Krystallisation des Schwefels aus seinem Schmelzfluss," *Neues Jahrb. f. Mineralogie, &c.*, 1899, Beil.-Bd. xiii. pp. 39-89; 7 plates).

The second pamphlet describes with equal minuteness the appearances shown under the microscope by chips and thin sections of dried gelatinous silica, as well as of the natural forms of colloidal silica, tabascheer and opal (including hydrophane and precious opal), which are all very similar in their minute structure.

Both pamphlets are admirably illustrated with numerous well-prepared microphotographs.

The School Journey. A Means of Teaching Geography, Physiography and Elementary Science. By Joseph H. Cowham. With additional "Journeys" by G. G. Lewis and Thomas Crawshaw. Pp. 79. (London: Westminster School Book Depot, 1900.)

FOR many years the study of geography at the Westminster Training College has been supplemented by an excursion from Croydon to Godstone, under the guidance of Mr. Cowham, the lecturer on education at the college, and the author of several excellent educational works. In this volume a description is given of the chief characteristics observable during the ramble; and horizontal and vertical sections, as well as photographic illustrations, elucidate the physical geography of the district traversed. In addition, the book contains accounts of excursions to Greenwich and Woolwich, and along a river bank in Lancashire, contributed by two of Mr. Cowham's former pupils.

The book appears at the right psychological moment; for the feeling that geography should, whenever possible, be made an outdoor study, is spreading, and every statement of experience is of value to teachers who want to improve methods of instruction in geography but are unable to see clearly how to carry out schemes which have been put on paper by persons who may not have given full consideration to ways and means. Here, however, we have notes upon actual excursions and how they were planned and performed, and with these before them, teachers should have no difficulty in arranging others if they have some knowledge of physical geography. The Geologists' Association and Prof. Seeley's Geological